

IOP

Institute of Physics

Environmental Physics Group

NEWSLETTER

October 2008



This image will be the cover of the new IoP Environmental Physics Group Flyer.
Credit: NASA (<http://visibleearth.nasa.gov/>)

<http://institute-of-physics.org/activity/groups/subject/env/index.html>

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News

Congratulations are in order for two members of the Committee.

- Vice President of the Group, Giles Harrison was recently promoted to Professor of Atmospheric Physics at the Department of Meteorology, University of Reading.
- Sally Brown has passed her PhD Viva at the School of Civil Engineering and the Environment, Southampton University. Her thesis title was, "Soft cliff retreat adjacent to coastal defences, with particular reference to Holderness and Christchurch Bay, UK". She is now working as a postdoctoral researcher in the same School, considering the implications of sea-level rise in the 21st century at global and regional scales

Well done to both Sally and Giles!

If you have any news items for the newsletter please contact Karen Aplin.

4th EPG Essay Competition

Entries are now invited for this year's EPG Essay Competition. The aim of the competition is to encourage and recognise excellence in communicating the significance, value and rewarding nature of engaging with environmental physics.

Entries should cover any aspect encompassed by the Group's interests in environmental physics, which include, but are not limited to: atmosphere and climate; hydrology; plant physics; glaciology; waste; energy; the built environment. prize money totals £500;

a certificate will also be awarded to the winning author(s);

the winning entry will be considered for publication (previous winners have been published in Physics Education);

all entrants will be offered 3 months free membership of the Group and of the IOP;

the competition is open to all, but entries from students are particularly welcome; essays must be no more than 2,000 words long;

the closing date is 31st December 2008.

Entries must be original and will be judged on writing quality and content. Essays adopting a purely scientific, policy-related or some other perspective will be welcomed. It is anticipated that presentations will be made to and by the winning author(s) at the Group's Environmental Physics meeting in March 2009.

Entries should be sent to: env.essay@physics.org, preferably as a pdf file, along with full contact details and student status if appropriate. Entries may be also be submitted by post to:

Environmental Physics Group Chair (essay competition),
c/o Science Support Officer,
The Institute of Physics,
76 Portland Place,
London,
W1B 1NT

Further details are available on the Group's web site or from env.essay@physics.org.

Environmental Physics Teaching Resources for Schools and Colleges Update

The Group has been working with the IOP Education department in developing environmental physics resources to support teachers who would like to use such contexts in their teaching. Thank you for all the enquiries and offers of help received since the last appeal. We have now received eight commentaries on various aspects of environmental physics and are very grateful for the support and the work they represent. We are intending to put these on the Schools and Colleges section of the IOP web-site in the near future and hope to develop some accompanying teaching resources.

The commentaries (of around 2000 words) are intended to provide background information for teachers at around A level/1st year university standard in terms of content. They are for teachers to use to inform themselves and not necessarily use directly with their students.

We are still looking for something on the following topics:

Various kinds of urban pollution, including sound

Background radiation and radon emissions

Sustainable buildings

Water resources and flooding

If you think you might be able to help and would like more detailed information about further topics and style, please contact me directly.

Clare Thomson

Curriculum Support Manager

Institute of Physics

Tel: 020 7470 4981

email: clare.thomson@iop.org

Climate Change Councils

Mike and Patricia Bell are leading a major 12 month environmental project: 100 Climate Change Councils - releasing our collective wisdom to take massive action on climate change. Our aims are to:

catalyze individuals and local groups to take action to address climate change.
create an ongoing community of practice with the power to impact attitudes and behaviours towards the environment.

communicate the recommendations for action that come from a 100 Climate Change Councils to the Copenhagen Climate Conference in 2009.

A Climate Change Council is based on tribal councils and is a way to resolve complex challenges by evoking the collective wisdom of people by looking into an important issue from eight perspectives that encompass the total system.



We will lead 100 Climate Change Councils in the UK between October 08 and September 09 and we are seeking to ally with organisations who have similar aims and values, and would be interested to host a Climate Change Council for their members. We are looking for 'hosts' to provide the venue for the day, food/refreshments, and 20-50 participants. For a contribution towards our costs, we will provide:

Two highly trained Climate Change Council leaders
Hosting Pack with full details about the day and what is needed

Materials for the Council – all documents for the

Council day

Write up of the outcomes of the Council

Online Community of Practice – share and learn with others

Newsletters – to stay informed and motivated

This is what you will get from the day:

A unique ready-made project, tailor made to your needs and no cost to your organisation.

Increased visibility by being part of a unique year long environmental programme

An additional opportunity for your members take action on climate change

An opportunity to recruit more members

An additional local, national and global voice for your members on green issues

The opportunity to be part of a wider community of practice sharing and learning together

A new sense of shared understanding, deeper insights and breakthrough recommendations for action

Experience of a powerful tool for resolving personal and community challenges

A heightened commitment to action.

To date we have almost 40 organisations and groups interested in hosting a Climate Change Council – ten have already booked events including Wildlife Trust, Age Concern, Transition Towns, Northmoor Trust and the Environmental Change Institute at Oxford University.

If you would like more information see www.climatechangecouncils.com or email mike@climatechangecouncils.com

Mike Bell

Membership of the Group Committee

The next Annual General Meeting of the EPG is scheduled for 25th March 2009 and members might like to start considering whether they would be interested in standing for election to the committee.

The committee meets approximately every 4 months, usually (but not always) in London. Most of our time is spent in productive discussion on planning events such as meetings and visits, on educational and public understanding activities such as the essay competition and on supporting the environmental physics community, for example through working with the IOP on policy-related and other consultations.

It is a strength that the current committee reflects a varied background and experience. It is rewarding work, not only through the formal output of the committee, but also in the contacts made with environmental physics colleagues.

This could be YOUR chance to become more involved with the Group and to make a difference. If you would like to know more about what might be involved, or need help in identifying proposers for a nomination, please contact Pat Goodman or Peter Hodgson (for contact details, see in this Newsletter) for an informal discussion.

Peter Hodgson
Chair, Environmental Physics Group

Supporting research students

Research Student Conference Fund

Providing financial support to research student members, to attend international conferences and major national meetings.

Apply for up to £250 during the course of your PhD.

Applications are considered on a quarterly basis and should reach the Institute by: 1 March, 1 June, 1 September or 1 December

For further information see www.iop.org or contact supportandgrants@iop.org

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Reports from previous events

Members' Meeting and AGM (IoP, 15th May 2008)

The keynote lecture was given by Professor Gerry Jennings of NUI Galway who talked about the people associated with the Mace Head site over the past 50 years and other related condensation stories. Measurements started at Mace Head 50 years ago as the site provided an ideal opportunity to measure particles in clean air. In 1973 a derelict cottage was purchased to help scientists with their measurements (who said scientists have modern labs?!). In the last 15 to 20 years there has been an increasing interest in the measurements with present monitoring including the radiative properties of aerosols and the physical and chemical concentration of particles. The benefits of long-term measurements were demonstrated by showing decreasing CFC levels after refrigerator manufacture regulations changed in the early 1990s.

This year, early career members of the EPG were encouraged to present their work. Firstly, Dr Curtis Wood of Reading University discussed his PhD work on meteorology and insects. An entertaining talk, Curtis explained how bugs are affected by atmospheric conditions such as temperature inversions. Food,

migration and mating determines the height in the atmosphere insects fly, and at what time of day the insects are active. Secondly, Dr David McGloin's talk 'Trapping aerosols with light' covered how to trap micromatter, but not with direct contact with the particle. Typically lasers can 'catch' particles as they experience a change in momentum. His research has implications on many subject groups such as the biological sciences where small forces are measured, and the handling and analysing of aerosols in a controlled manner.

After a tea break, two of the more experienced members of the Group discussed their work. Dr Steve Hoon of Manchester Metropolitan University aims to understand the behaviour of desert sand, and the biological crust that forms on desert dunes. In desert conditions, this can be challenging. Unlike Mace Head's first lab of a derelict cottage, Steve's lab is only a tent. However, unlike the remoteness of Mace Head, Steve has occasional visitors, including snakes and lions! Finally, Dr Donald Swift-Hook presented his ideas on renewable energy. Donald explained and gave examples of renewable energies. He questioned why renewables are needed, both presently and in the future, and covered topics such as resource scarcity, reserve security, costs, locality and climate change.

This year sadly, the essay winners were unable to present their work, so a brief AGM followed the presentations. The members meeting was followed by Professor Richard Wakeford's evening lecture on 50 years of investigations of the Windscale nuclear reactor accident. Overall, the 5th Members' Meeting was a very enjoyable event.

Sally Brown

Providing Regional Climates for Impact Studies (PRECIS) Workshop (Reading, 11th-15th August 2008)

This is a short report describing my participation in the PRECIS Training Workshop jointly organised by the UK Met Office, Hadley Centre for Climate Prediction and Research, and the UNDP National Communication Support Programme (NCSP).

The Department of Physics at the University of Malta is coordinating a project to prepare the Second Communication of Malta to the United Nations Framework Convention on Climate Change (UNFCCC). To support the research required in this project, the Department of Physics has the intention to build capacity in regional climate modelling and very recently we have acquired the model PRECIS (Providing REgional Climates for Impact Studies) from the Met Office, Hadley

Centre, UK, in order to fulfill our scientific obligations in the abovementioned ongoing activities.

The Workshop was held in the Department of Meteorology, University of Reading and apart from a series of technical presentations, followed by question and answer sessions; it was packed with hands-on practical sessions on the many aspects of running PRECIS and analysing output data.

The aim of the workshop was to ensure that participants acquire the necessary scientific and technical knowledge to run PRECIS. It emphasised the limitations and uncertainties associated with regional climate models in order to assist users to make the best possible experimental designs and best use of their outputs. In bringing together participants from several countries, the workshop also served as a vehicle for cooperation between the participants and their respective institutions, especially those involved in vulnerability and adaptation assessments.

The participants were asked to deliver a short presentation on their intended use of the PRECIS model. I explained that, from the point of view of the personnel working on the second national communication, the primary task is an improved climate impact assessment, followed by detailed vulnerability analysis and the compilation and analysis of national adaptation strategies and measures. This requires the generation of high resolution climate scenarios focusing on the central Mediterranean. Acquisition and use of the PRECIS model by the project personnel based in the Physics Department is expected to lead to the generation of climate scenarios based on more than one emission scenario. This will give scope for a more thorough analysis of adaptation measures.

In the medium and long term, the capability of in-house climate scenario generation will make it possible for the University of Malta to encourage postgraduate students to tackle research into climate change issues. It is hoped that the initial input received through participation in the PRECIS workshop will serve as seed for future developments, where the primary task would be to address gaps in knowledge associated with climate change issues in the Mediterranean region.

Noel Aquilina (University of Malta) was supported to attend this workshop by the IoP Research Student Conference Fund.

Optical Environmental Sensing VI (Edinburgh, 29th August 2008)

The sixth in the series of Optical Environmental Sensing meetings, organised by the Optical and Environmental Physics Groups of the Institute of Physics, this year formed one of the sessions at the biennial Photon08 optics conference. A smaller audience than in previous years, perhaps due to the meeting being scheduled as one of the last sessions of the conference, nonetheless enjoyed a range of talks on optical techniques applied to environmental problems.

Professor Helmut Telle of Swansea University, the invited speaker this year, spoke on Laser Induced Breakdown spectroscopy (LIBS). He explained the potential for the use of LIBS as a technique for environmental monitoring, for example in aerosol monitoring and in soil measurement, but also pointed out the obstacles for the broader uptake of the technique. These obstacles typically relate to the need for quantitative analysis at low concentrations and mean that opportunities for LIBS in environmental applications are limited.

Other talks focussed largely on gas analysis, the current interest in the hydrogen economy providing just one impetus for some novel sensor developments. Johan Hult of the University of Cambridge presented his work on the use of a supercontinuum source, combined with an enhanced spectroscopic technique (cavity enhanced broadband spectroscopy), for the simultaneous detection of multiple gas species.

Peter Hodgson

Physics of Estuaries and Coastal Seas (Liverpool, 25th-29th August 2008)

Physics of Estuaries and Coastal Seas (PECS) is a biennial conference at which scientists from across the world meet to present and discuss the latest research in the field of marine physics in the coastal zone. The scope of the conference encompasses field and laboratory measurement, as well as theoretical and numerical analysis. Topics discussed range from fluid dynamics and mixing, through to sediment transport and beach morphodynamics. PECS 2008 was held in Liverpool, 25th - 29th August, coinciding with the 2008 European capital of culture celebrations held in the city. Approximately 120 delegates from six continents attended the conference, in which all sessions were held in plenary format.

PECS 2008 was a very successful conference at which there were many excellent talks and posters. Particularly interesting was the talk of Catherine Edwards (University of North Carolina) entitled "Near-resonant response of the coastal ocean to sea breeze wind forcing in the Georgia Bight near the critical latitude". In this paper observations of large non-tidal surface currents were presented, with a large variance at the diurnal frequency. It was argued that these currents arise due to a resonance between the sea breeze and inertial oscillations, which at 30° latitude have a similar frequency. Another interesting paper, given by John Simpson (University of Bangor), was titled "Advection and diffusion versus mussel filtration in a tidal channel". Here the physics of the flow through the Menai Strait, which yields 10,000 tonnes of farmed mussels annually, was explored in order to quantify the biological limits to mussel production in the strait.

During the conference I gave my talk "Observations of the effects of turbulence on particle size distributions in an estuarine bottom boundary layer". I had observed that the median particle size of suspended sediment in the Dee estuary decreases as turbulent dissipation rates increased. This is attributed to high levels of turbulence breaking up aggregates of particles. I was asked some interesting questions after my talk and also had the opportunity to discuss my results with other people conducting similar research.

PECS 2008 was an excellent conference and I believe that attending was very beneficial to me. I took the chance to hear world leaders in my field present their work, and also to present my work in front of them. This conference also allowed me to hear about marine physics research not directly related to my work, allowing me to see how my work fits into the wider sphere of coastal marine physics. Not only was the academic programme of the highest class, but a superb series of excursions and social events also ensured ample interaction between delegates. An evening cruise on the Mersey, with music provided by The Merseysippi Jazz Band (who were once supported by The Beatles) was most entertaining, and the conference dinner at the Merseyside Maritime Museum ended the week on a high note.



Attendees at the PECS conference

Many thanks to the Institute of Physics and the Environmental Physics group for providing financial assistance towards attending this conference.

Will Thurston (School of Earth and Environment, University of Leeds)

Forthcoming Events

Earthquakes: Bumps in Britain, Catastrophe in China (Sheffield, 28th October 2008)

5.00pm, Department of Physics & Astronomy, University of Sheffield, organised by the EPG and Yorkshire Branch of the IOP. Dr. Brian Baptie, seismologist with the British Geological Survey, will talk about recent earthquakes, including that of February 2008, felt widely across the Yorkshire region and beyond.

Further details are available from the Group's web pages, at:
http://www.iop.org/activity/groups/subject/env/envp_calendar/index.html

Sustainable Energy: New Solutions from Physics and Engineering (IoP, 29th October 2008)

9:45am - 6:00pm, IOP in London, organised by the Applied Physics & Technology Division of the IOP. Registration is required for this meeting.

Further details are available from the Group's web pages, at:
http://www.iop.org/activity/groups/subject/env/envp_calendar/index.html

Association for Science Education Annual Conference (Reading, 8th-10th January 2009)

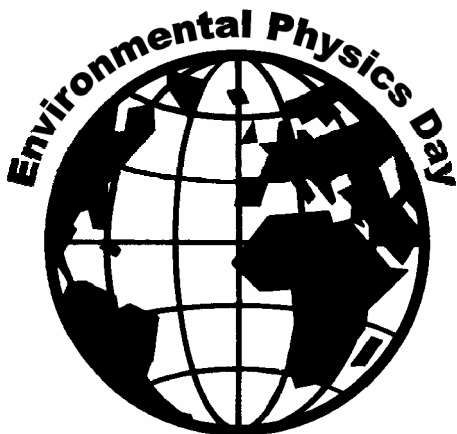
Thursday 8th January has a programme of talks and workshops with an environmental focus. If you are interested in attending, go to www.ase.org.uk for more information.

Environmental Physics Day (IoP, 25th March 2009)

Building on the success of previous events, the Environmental Physics Group (EPG) is pleased to announce that the annual Environmental Physics Day will take place on 25th March 2009. The day will see a mix of presentations from environmental physicists from a variety of disciplines (such as geographers, mathematicians and meteorologists) including the EPG essay winners. The AGM and evening lecture will conclude the day. It is a relaxed and friendly event to discuss environmental physics and find out more about the group and its members. We invite members of the EPG to present their research in poster and oral forms—this is your chance to get involved.

Are you a new or aspiring member?

Over the past few years, our membership numbers have significantly increased, and we are particularly keen to welcome new members, or those who think they would like to join the IOP or EPG at this event.



Are you a younger or early career environmental physicist?

Students: This year's Environmental Physics Day is in March—so we hope it won't clash with your exams! We welcome presentations (both poster and oral)—poster/talk 'recycling' from other meetings is encouraged. If you haven't presented before it doesn't matter as long as you have the enthusiasm to share your research with others. If you are an undergraduate, don't be shy—please

come along on the day to see what other environmental physicists do. There are travel bursaries available, and students are particularly welcome to apply for these.

There will be no charge to group members attending the meeting. Non-members will also be very welcome to attend (limited number of places available) subject to a registration fee of £10.

Further details of the day and AGM will be sent in the winter, and will be posted on the EPG website at <http://www.iop.org/activity/groups/subject/env/index.html>

Please contact: Sally Brown (sb20@soton.ac.uk) indicating your attendance and if you would like to give an oral or poster presentation

Evening Lecture (IoP, 25th March 2009)

There will be an evening lecture after the Environmental Physics Day sponsored by the Environmental Physics Group and the London and South East branch of the Institute of Physics.

Professor Robert Nicholls (School of Civil Engineering and the Environment, University of Southampton) will speak on "The effects of sea-level rise".

EPG Committee

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This newsletter is also available on the web and in larger print sizes

The contents of this newsletter do not necessarily represent the views or policies of the Institute of Physics, except where explicitly stated.

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